

REMARKS

The office action of September 28, 2004, has been carefully considered.

It is noted that Figures 1-4 are objected to for not being designated with the legend "Prior Art".

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph.

Claims 1 and 3-15 are rejected under 35 U.S.C. 102(b) over the patent to Tarter.

Claims 1-3 and 5-15 are rejected under 35 U.S.C. 102(b) over the patent to Evans.

In view of the Examiner's rejections of the claims, applicant has canceled claims 2 and 3, and amended claims 1 and 5-7.

It is respectfully submitted that the claims now on file particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended the claims to address the points raised by the Examiner.

Amendments to the Drawings:

The attached sheets of drawings include changes to Figs. 1-4. These sheets, which include Figs. 1-6, replace the original sheets including Figs. 1-6. In Figs. 1-4, the legend "prior Art" has been added.

Attachment: Replacement Sheets (2)

In view of these considerations it is respectfully submitted that the rejection of claims 1-12 under 35 U.S.C. 112, second paragraph is overcome and should be withdrawn.

It is respectfully submitted that the claims presently on file differ essentially and in an unobvious, highly advantageous manner from the constructions disclosed in the references.

Turning now to the references and particularly to the patent to Tarter, it can be seen that this patent discloses a disk brake. In Tarter, the back plates, as part of the brake pads, symmetrically opposite. As described at column 3, lines 4-15 of Tarter, the brake pads and backing plate are directly supported and guided by the arms 54,56 of the anchor plate 27. The outward or rim-side friction pad 44 and backing plate 46 are not supported in the rim-side caliper leg, as in the presently claimed invention. Thus, in Tarter the load moment cannot to begin with act upon the caliper, whereas the present invention eliminates the load moment.

In Tarter only the friction coatings on the back plates are adjusted relative to one another. However, since both back plates are directly guided and supported on the brake carrier, the circumferential braking forces generated during braking operation are conducted to the brake carrier.

The friction coatings on the back plates and adjustable to each other are only for the purpose, according to the description in Tarter, to reduce oscillations and a resulting brake squeal. Only for this purpose is the lining structure adjusted, as shown in particular in Figs. 7 and 8 of Tarter. In this way a different lining contact surface engages the rotor and as a consequence an unsymmetrical stress surface. As a result of this construction unequal friction contact is present on both sides of the rotor, which further results in a tilting of the caliper and a disadvantageous tangential wear, at least in the rim side brake lining due to an unequal pressure on the lining.

Thus, it is respectfully submitted that Tarter does not disclose a disk brake as recited in the amended claims now on file.

In view of these considerations it is respectfully submitted that the rejection of claims 1 and 3-15 under 35 U.S.C. 102(b) over the above-discussed reference is overcome and should be withdrawn.

The patent to Evans discloses a sliding caliper disc brake in which the caliper 16 and the outboard brake pad assembly 17, which is attached to the outer leg 18 of the caliper by screws 51, are

guided along a single pin 12. The inboard brake pad assembly 23, on the other hand, is, together with its back plate 35, is supported on both a second pin 11 as well as by grooves 41 in guides 20 of the caliper.

In this way the outer lining and the inner lining are guided along different pins. Thus, the circumferential braking forces of the outer lining are conducted away separately. Partially via the caliper 16 on a pin 12, and partially via the back plate 35 of the inner brake assembly, through the arrangement against the guides 20 and then through the caliper in the second pin 11. Since here detrimental differing lever moments and friction forces interact, the "theoretical" separation of the moments is extremely questionable and is not useable in practice.

In the presently claimed invention, on the other hand, the brake moment forces leave from the outer brake lining on the reaction side directly over the caliper's holding part. The forces are thus not taken up by or transferred to the inner lining.

Another disadvantage of the Evans construction is that the brake pads are formed differently, as seen in Figs. 4, 12, 13 and 14. Thus, seen on the friction surface of the rotor on the one hand and the piston surface as the stressing device on the other hand, differing radial distances are present. Claim 6 states that

the outer pad surface is straight on the radially inner side. Thus, the pad surface on the radially inner side does not match the friction surface diameter of the rotor. This results in unequal friction moments between the pad surfaces. Furthermore, according to claims 6 and 7 of Evans, the outer pad is provided with unsymmetrical positioning components, which are not present in the present invention. In the present invention the outer pad is inserted through a radial opening in the caliper and is supported there both laterally and radially inwardly.

Although Evans describes that the pads can be adjusted relative to each other, the outer caliper leg does not grip the pad fastened to it in a full-surface manner. The pad extends away in the rotation direction, as seen in Figs. 4 and 5. The holding screws are arranged unsymmetrically to the tension axis (See Fig. 12, 47 and 49). In this way both the holding points as well as the leg contact surfaces are different relative to the brake pads.

Since the brake moment forces from the pad are always introduced in the region where the force/form locking between these two parts exists, this follows in the region of the screwing. Thus, there are no optimal lever moments as in the presently claimed invention.

Since the brake pad is always loaded by the contact area of

the leg surface, via which the closing force is transferred against the brake pad and in the direction of the rotor, with the Evans construction only results in a segmented moment introduction. Thus, the actual friction surface does not press uniformly over its entire length against the rotor, with the result that edge pressing with localized over-heating including uneven wear is not excluded. Particularly, lever moments can be introduced above the rotor diameter over the force side pad guide and support on the caliper, which moments detrimentally load the caliper in the peripheral direction. This arrangement must always be clamped.

The present invention has a caliper that surrounds the pad whereby the braking moment force is introduced from the side end of the pad/pad carrier into the contact surface of the caliper leg. Due to this construction improved counter-moments are obtained which leads to reduced work by and stress on the guiding and holding parts of the caliper, as well as a simplified construction of the entire system, particularly in commercial vehicles. Such a construction is not disclosed by Evans.

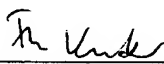
In view of these considerations it is respectfully submitted that the rejection of claims 1-3 and 5-15 under 35 U.S.C. 102(b) over the above-discussed reference is overcome and should be withdrawn.

Relative to the drawings, applicant has attached replacement sheets containing Figs. 1-6, in which Figs. 1-4 have been changed to include the legend "Prior Art".

Reconsideration and allowance of the present application are respectfully requested.

Any additional fees or charges required at this time in connection with this application may be charged to Patent and Trademark Office Deposit Account No. 11-1835.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450 Alexandria, VA 22313-1450, on December 28, 2004.

By: 
Friedrich Kueffner

Date: December 28, 2004